

**POST-CONSTRUCTION REPORT/CORRECTIVE MEASURES
IMPLEMENTATION REPORT/FINAL REMEDIATION REPORT FORMAT**

1.0 GENERAL DESCRIPTION

1.1 Purpose and Scope

This Post-Construction Report/Corrective Measures Implementation Report/Final Remediation Report (PCR/CMIR/FRR) documents the completion of field implementation of the remedial action (RA) for the closure of the *Operable Unit Name* operable unit (OU). It summarizes construction activities performed to implement the remedial action requirements in the *Operable Unit Name (acronym)* Record of Decision (ROD) (WSRC XXXX) in accordance with the approved Corrective Measures Implementation /Remedial Action Implementation Report (CMI/RAIP) (WSRC XXXX). [Note: Delete CMIR and CMI from throughout this document if the OU is CERCLA only.]

This PCR/CMIR/FRR was completed after final inspection of construction and a determination that the remedial action is complete. The Savannah River Site (SRS) notified U.S. Environmental Protection Agency (USEPA) Region IV and South Carolina Department of Health and Environmental Control (SCDHEC) regarding completion of the aforementioned final inspection and the operation and function determination on (date). This PCR/CMIR/FRR is submitted to USEPA and SCDHEC for approval in accordance with Federal Facility Agreement (FFA) requirements. Completion of the post-construction activities is reported in Section 7.0 in accordance with the FFA.

This report has been prepared in accordance with the requirements for submittal of regulatory documents as identified in the FFA (FFA 1993) and the latest format for the PCR/CMIR/FRR. This format was developed in accordance with the

resolution of the USEPA comments on required contents for PCR/CMIR/FRR and USEPA latest guidelines (USEPA 2000).

This report includes the following items:

- A brief description of the OU background, including a brief statement on remedial action requirements and objectives in the ROD
- A chronology of completed events related to remediation of the OU
- A summary of construction activities performed
- Deviations from the original design of the approved CMI/RAIP (WSRC XXXX)
- Performance standards and quality control inspections, including a summary of performance test results documenting verification of compliance with the acceptance criteria in the CMI/RAIP (WSRC XXXX)
- Final inspection and certification of OU closure
- As-built drawings
- Land Use Controls
- Project costs (including RA capital costs incurred to date, forecast RA operating costs, post-RA annual operations and maintenance (O&M) costs and total present worth (PW) costs)

1.1.1 Document Format

The Operable Unit name RA is complete and does not require long-term remedial actions, i.e., the final remedial action does not require long-term operation of constructed equipment or systems for treatment of contaminants in the source unit or in the groundwater. Therefore, the PCR/CMIR and FRR are herein combined. The ERD Regulatory Handbook (WSRC 2000) includes an approved template for CMIR/PCR/FRR, which is the basis of this document's format.

[Typically addresses the document format used, including the basis for the format. This section should include specific details regarding any deviation from the generic description as well as the basis of the deviation.]

1.2 Operable Unit Background

The *Operable Unit Name* source OU is listed as a RCRA 3004(u) Solid Waste Management Unit/CERCLA unit in Appendix C of the FFA for SRS.

[Copy an abbreviated description of the waste unit from the ROD. Include only these components which are addressed by the RA. Include all components with an RAO. The description should include location, size, and the background operational history of the unit requirements including whether the OU is a RCRA and/or CERCLA unit. The section may also include a short paragraph identifying the predecessor documents related to the selection of the remedial action. Provide figures showing remedial action location at SRS (Figure 1) and a pre-remedial action site layout (Figure 2). A very condensed presentation of information is appropriate for this section since the same information has been covered in greater detail in previous documents required by the FFA process.]

Figure 1. ***Operable Unit Name*** Location on SRS Map

Figure 2. ***Operable Unit Name*** Pre-Remediation Action Site Plan

1.2.1 General Description and Location of Operable Unit Name

The *Operable Unit Name* (Figure 1) is located within the SRS, approximately TBD feet south of the (e.g., C, K, L, P, or R-Area Reactor) perimeter fence and XXXX feet north of

1.2.2 Nature and Extent of Contamination in Operable Unit Name Soils (Source Unit)

[Briefly identifies the constituents of concern (COCs) and principal threat source material (PTSM) (table may be used) copied from the ROD that are considered for the remedial action (RA), and the associated risks, specific components of the unit requiring remediation and locations of COCs and PTSMs with respect to the zone of remediation (areas and depths). Because the information is covered in greater detail in previous FFA documents, a condensed presentation (synopsis or summary) is appropriate for this section. Provide or reference figures or maps for the design clarification of data already provided in the ROD to illustrate the nature and horizontal and vertical extent of COCs and PTSMs (Figure 3).]

Figure 3. Nature and Horizontal and Vertical Extent of COCs

**1.2.3 Nature and Extent of Contamination in *Operable Unit Name*
Groundwater**

[Briefly identifies the COCs and PTSM (table may be used) identified in the ROD that are considered for remedial action, and the associated risks, specific components of the unit requiring remediation and locations of COCs with respect to the zone of remediation (areas and depths). Because the information is covered in greater detail in previous FFA documents, a condensed presentation (synopsis or summary) is appropriate for this section. Provide or reference figures or maps for the design clarification of data already provided in the ROD to illustrate the nature and horizontal and vertical extent of COCs (Figure 3).]

1.3 Remedial Action Requirements and Objectives

1.3.1 Remedial Action Objectives

As detailed in the ROD, the RAOs for the *Operable Unit Name* are as follows:

[Copy RAO text from the ROD for OU.]

Per the ROD, the remedial action objectives (RAOs) for this RA would be achieved by implementing the below remedial action.

1.3.2 Selected Remedial Action

As stated in the ROD (WSRC XXXX), the selected remedial action for the *Operable Unit Name* soils included the following key elements:

[May include post-remediation action site plan (Figure 4) or a reference to the specific as-built drawings in Attachment A. May include a "cartoon" of the conceptual site model (CSM) (Figure 5) from the ROD or a reference to the LUCIP figure number if the CSM is contained therein and attached as Appendix A.]

Figure 4. Post-Remediation Action Site Plan

Figure 5. Conceptual Site Model

1.4 Chronology of Events

[A tabular summary (reference Table 1) that lists major milestones and dates related to the remedial action for the OU, including the ROD signature, CMI/RAIP approval, major construction events (e.g., RA start, mobilization, pilot test, etc.), verification sampling and performance testing, inspections, identification and resolution of non-conformances (if any), demobilization and final inspection of completed construction.]

Table 1. Chronology of Events

<u>Description of Activity</u>	<u>Start Date</u>

2.0 CONSTRUCTION ACTIVITIES

[Provides a summary of construction activities performed during the construction phase in accordance with the approved CMI/RAIP. The summary will be a brief narrative following the same sequence of activities as listed in Section 1.4. In addition to the below subsections, this section also briefly describes materials and equipment used, name and roles of subcontractor(s) associated with the remedial action, description of any treatment process required to implement the remedial design, successes and problems encountered during construction and resolutions of problems (including innovative solution, if any) and causes for any delay. This section also includes a brief discussion of unexpected conditions encountered in the field, particularly those that affected the scope or schedule of the construction work.]

2.1 *Operable Unit* Construction Team

The construction subcontract was awarded on date to Company and Subcontractor Names, (including City, State). [Include major subtier subcontractors and brief scope description for each subtier]. The subcontractor(s) were selected per SRS subcontract procurement requirements.

2.2 Secondary/Job Control Waste Disposal

[This section should summarize the requirements of the unit's waste management plan and the CMI/RAIP waste section. Describe the method, consistent with SRS procedures, that was used for waste characterization (e.g., testing methods), disposal (include location such as onsite, offsite at SRS, off SRS at XYZ facility) and transportation (include contaminant limits) during construction, as applicable to the selected remedial action. Unless a unit specific plan is required by permit requirements per SRS procedures, the Waste Management Plan need not be included as an attachment to the PCR/CMIR/FRR. An example follows.]

3.0 DEVIATIONS FROM ORIGINAL DESIGN

[Identifies design changes required during construction as well as the technical basis for those changes. The discussion includes all changes made during construction, regardless of whether those changes were previously communicated to South Carolina Department of Health and Environmental Control (SCDHEC) and United States Environmental Protection Agency (USEPA). The process and scope of design change notifications are discussed in the CMI/RAIP.]

Several design and construction changes were needed during construction to resolve construction problems. The project team reviewed all changes prior to

implementation to ensure compliance with regulatory requirements in the ROD and the CMI/RAIP. Consistent with the CMI/RAIP, notifications were made to USEPA and SCDHEC prior to implementation, as appropriate. Table 2 provides a summary of all such changes.

The basis and resolution of deviations from the original design are detailed below. Where applicable, a statement is provided on whether the deviation still meets a performance criterion.

Table 2. Summary of Design Changes

Item	Change	Reason
1		
2		
3		

4.0 VERIFICATION SAMPLING, TESTING, ANALYSIS, PERFORMANCE STANDARDS, AND CONSTRUCTION QUALITY CONTROL

4.1 Performance Requirements/Standards

[For each RA component (e.g., cover, soil treatment, soil disposal, etc.), subsections of Section 4.0 will cite appropriate references to the performance requirements (acceptance criteria) as required per the CMI/RAIP for the remedial action and the construction quality control requirements in the specification. Provides a brief discussion and table of test samples, a comparison of test results with CMI/RAIP acceptance criteria, and a description of how those criteria were met but with allowances for deviations outlined in Section 3.0. It also provides discussion on other non-conforming conditions identified during the quality control inspection and how those non-conformances were resolved to meet the specified performance criteria.]

[Each subsequent section should provide a list or table of performance requirements, acceptance criteria and/or process control parameters copied from the approved CMI/RAIP. A summary table (Table 3) is suggested which lists the specific attributes required and the specific tests for each attribute. If numerous tests are conducted, a minimum, maximum, average summary is suggested along with footnotes for failed entries where applicable].

Table 3. *Operable Unit Name* As-Built CMI/RAIP Characteristic Test Results

4.2 Construction and Quality Control

[Provides a summary of quality assurance (QA) and quality control procedures that were implemented to ensure successful implementation of the remedial action. It also includes any special or unit-specific strategy applicable to the RA.]

5.0 FINAL INSPECTION AND CERTIFICATION OF OU CLOSURE

[Provides the text stating that: (1) As detailed in Section 4.0, the construction activities required for the remedial action have met the acceptance criteria established in the approved CMI/RAIP, but with allowances for deviations outlined in Section 3.0. (2) As outlined in Section 5.1, the final walkdown inspection with participation of USEPA and SCDHEC (as applicable) has been performed and issues closed out. (3) As detailed in Section 5.2, the RA is certified as complete and that construction and testing was in accordance with the ROD RAOs. Section 5.2's certification is typically based upon the result of performance tests and quality control inspections provided in the verification in Section 4.0.]

5.1 Final Inspection for Acceptance of Operable Unit Name Closure

A final joint walkdown was performed on month/day/year by the Operable Unit Name Project Team, SCDHEC and USEPA. No further outstanding issues resulted from the walkdown. A summary and participants of the USEPA/SCDHEC inspection is provided in Appendix B.

5.2 Certification of RA Completion

[List the primary RA components (e.g., a cover, soil treatment, soil disposal, etc.) and include a certification statement on which and how each applicable RAO was met. Each RAO should be copied from the ROD.]

In accordance with the guidance from USEPA Region IV office regarding the intent of "certification" terminology, a Professional Engineer's certification is not required. Instead, this section provides the verification that RAOs established in the ROD have been met through field implementation of the remedial action per the approved CMI/RDR/RAWP (WSRC 1999). The verification is based on the Section 5.1 walkdown and successful achievement of the RAOs per discussion above, it is concluded that the *Operable Unit Name* closure has been completed satisfactorily in accordance with the requirements of the *Operable Unit Name* ROD. In accordance with the ROD, applicable post-closure activities (e.g., land use control, 5-year ROD reviews, etc.) will be performed as described in Section 7.0 of this PCR/CMIR/FRR.

6.0 AS-BUILT DOCUMENTATION

6.1 As-Built Drawings

[This section provides the as-built drawings for the project, which are updated CMI/RAIP drawings and are included in Attachment A of this PCR/CMIR/FRR.]

6.2 Well Abandonment Report

See Appendix B of this PCR/CMIR/FRR.

7.0 POST-PCR/CMIR/FRR ACTIVITIES AND LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

For Post-PCR/CMIR/FRR activities, see the OU specific LUCIP (Appendix A) required for the RA. Maintenance and institutional controls per the LUCIP (if applicable) will be reported during the five-year review of the ROD.

7.1 5-Year ROD Review

Section 300.430(f)(ii) of the NCP requires that a 5-year remedy review of the ROD be performed if hazardous substances, pollutants, or contaminants above levels that allow for unlimited use and unrestricted exposure remain in the OU. The three parties, SCDHEC, USEPA, and USDOE have determined that a 5-year review of the ROD for the Operable Unit Name will be performed to ensure that the remedy continues to provide adequate protection of human health and the environment.

8.0 PROJECT COSTS

[Provides in a table format (reference Table 3) a cost comparison of the final costs for the remedial action to the original ROD cost estimate. Cost deviations, beyond -30% and +50%, from the ROD cost estimate are discussed. The cost breakdown is limited to that which was presented in the ROD (e.g., limited to the soil cover total capital and total O&M costs and the AS/SVE total capital and total 5-year O&M costs). As an example, the combined RA comparative capital costs and O&M costs for a soil cover and a SVE/AS system are as follows:]

Table 4. Project Cost Comparison

	Project Cost Comparison (Example)		
	ROD Cost (\$K)	Incurred Cost (\$K)	Delta Cost (\$K)
Soil Cover Capital	175	157	(10%)
AS/SVE Capital	800	690	(14%)
Soil Cover O&M	20	25	+25%
AS/SVE O&M	1200	2735*	+228%**

9.0 REFERENCES

[Provides a list of documents referenced in the body of the PCR/CMIR/FRR document. Note: Regulators have asked that the Erosion Control Plan, HASP and well abandonment applications be included in the appendix rather than simply referenced.]

EPA, 2000. *Closeout Procedures for National Priorities List Sites*, #EPA-540-R-98-016, January 2000

FFA, 1993. *Federal Facility Agreement for the Savannah River Site*, Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

WSRC, 1994. *Investigation-Derived Waste Management Plan (U)* WSRC-RP-94-1227, Rev. 2, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1994a, WSRC E7 Manual, *Conduct of Engineering and Technical Support (U)*, Rev. 7, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1994b, WSRC Procedure Manual 1Q, *Quality Assurance (U)*, Rev. 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1997a. *Record of Decision, Remedial Alternative Selection for the Operable Unit Name*

WSRC, 1999. *Corrective Measures Implementation Plan/Remedial Action Implementation Plan/Remedial Action Implementation Plan for the Operable Unit Name*

WSRC, 1999b, *Operable Unit Name Remediation System Startup Test Plan (U)*, Q-SUP-X-XXXX, Revision 2, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1999c, "*Operable Unit Name Startup Test Procedure (U)*", ER-TP-XXX, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2001. *ERD Regulatory Handbook*, ERD-AG-003, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

10.0 APPENDICES

[Provides a list of reports or other stand-alone documents referenced in the body of the PCR/CMIR/FRR (e.g., LUCIP).]

Appendix A LUCIP

Appendix B Significant Reference Documents

11.0 ATTACHMENTS

[Provides documents developed specifically for this project (e.g., as-built drawings).]

Attachment A As-Built Drawings

Appendix A

LUCIP

for *Operable Unit Name (Bldg. No.)*

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

[Any design deviations impacting the latest LUCIP shall be incorporated into the LUCIP to ensure the as-built RA can fully implement the LUCIP. If required, the LUCIP shall be revised in accordance with the LUCIP template. If there are no impacts, simply attach the latest LUCIP.]

Appendix B

Significant Reference Documents

[Examples: RA Start Notification Letter, Fact Sheet, USEPA/SCDHEC Walkdown Memo, Erosion Control Plan, HASP, Well Abandonment Reports]

Attachment A
As-Built Drawings